PATENT COOPERATION TREATY PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P20020362WO				FOR FURTHE	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)		
				International filing 13.05.2003	date (day/month/year)	Priority date (day/month/)	year)
į.	rnation 2K5/0		nt Classification (IPC)	or both national classific	ation and IPC		
	licant NY E	RICS	SON MOBILE CO	MMUNICATIONS A	NB et al.		
1.	This Auth	interr	national preliminary e and is transmitted to	examination report ha the applicant accordi	s been prepared by this ng to Article 36.	s International Preliminary Ex	amining
2.	This	REPO	ORT consists of a tol	tal of 6 sheets, includ	ling this cover sheet.		
	This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).						
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3.	This	repor	t contains indications	s relating to the follow	ving items:	•	
	ı	🖾	Basis of the opinior				
	H		Priority	•			
	111		•	of opinion with regar	d to novelty, inventive s	tep and industrial applicability	v
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			Reasoned stateme citations and explain	•	(ii) with regard to novel	ty, inventive step or industria	l applicability;
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	VI VII		citations and explai Certain documents	nt under Rule 66.2(a) nations supporting su	ch statement	ty, inventive step or industria	applicability;
			citations and explain Certain documents Certain defects in the	nt under Rule 66.2(a) nations supporting su cited	cation	ty, inventive step or industria	l applicability;
	VII		citations and explain Certain documents Certain defects in the	nt under Rule 66.2(a) nations supporting su cited he international applic	cation	ty, inventive step or industria	l applicability;
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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP 03/05069

I.	Basi	s of	the	repor	t
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1. With regard to the **elements** of the international application (Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)):

	Des	scription, Pages	
	4-9		as originally filed
	1-3		filed with telefax on 05.05.2004
	Cla	ims, Numbers	
	1-8		filed with telefax on 05.05.2004
	Dra	wings, Sheets	
	1/1		as originally filed
2.	With lang	h regard to the langu guage in which the int	age, all the elements marked above were available or furnished to this Authority in the ternational application was filed, unless otherwise indicated under this item.
	The	ese elements were av	ailable or furnished to this Authority in the following language: , which is:
		the language of a tra	anslation furnished for the purposes of the international search (under Rule 23.1(b)).
		the language of pub	lication of the international application (under Rule 48.3(b)).
		the language of a tra Rule 55.2 and/or 55.	anslation furnished for the purposes of international preliminary examination (under 3).
3.	Witl inte	n regard to any nucle rnational preliminary	eotide and/or amino acid sequence disclosed in the international application, the examination was carried out on the basis of the sequence listing:
		contained in the inte	rnational application in written form.
		filed together with th	e international application in computer readable form.
		furnished subsequer	ntly to this Authority in written form.
		furnished subsequer	ntly to this Authority in computer readable form.
		The statement that t in the international a	he subsequently furnished written sequence listing does not go beyond the disclosure pplication as filed has been furnished.
		The statement that t listing has been furn	he information recorded in computer readable form is identical to the written sequence ished.
4.	The	amendments have r	esulted in the cancellation of:
		the description,	pages:
		the claims,	Nos.:
		the drawings,	sheets:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP 03/05069

5. Mathical This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

see separate sheet

- 6. Additional observations, if necessary:
- V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- 1. Statement

Novelty (N)

Yes: Claims

No: Claims

Inventive step (IS)

Yes: Claims

1-8

No: Claims

Industrial applicability (IA)

Yes: Claims 1-8

No: Claims

2. Citations and explanations

see separate sheet

Re Item I Basis of the report

The amendments filed with the Fax dated 05.05.04 introduce subject-matter which extends beyond the content of the application as filed, contrary to Article 34(2)(b) PCT. The amendments concerned are the following: Page 3, paragraph 2, in particular lines 9-11.

For this additional information concerning the advantages of the subject-matter of the invention there is no basis in the application as filed.

These advantages have been correctly described in the letter of reply and are considered by the examiner in analysing inventive step.

However the information concerning these advantages should not have been incorporated into the application (Article 34(2)(b) PCT) as the applicant did.

This report has been established as if the amendments that are not in accordance with Article 34(2)(b) PCT had not been made.

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1: US-B1-6 177 881 (CASTANEDA JULIO C ET AL) 23 January 2001 (2001-01-23)

D2: US 2002/027009 A1 (SATO NORIYOSHI ET AL) 7 March 2002 (2002-03-07)

Novelty:

D1 is considered to represent the nearest state of the art. It discloses an electronic device with the features of the preamble of Claim 1.

In the device known from D1 the vibrator is mounted on the side of the shell facing the front cover. This implies that the vibrator cannot be electrically connected (e.g. soldered) to the PCB in a single assembling operation together with the other electrical or electronic components of the device.

The device described in the new Claim 1 differs from said device known from D1 in the characterising features (derived from the original dependent claim 3).

For this reason subject-matter of Claim 1 is novel in respect of prior art as defined in the regulations (Rule 64(1)-(3) PCT).

Inventive step

The problem to be solved can be regarded as to improve the device known from D1 in order to permit a more efficient assembling of the device.

The characterising features saying that the vibrator (9) is mounted on a side of the shell element (5) that faces the PCB (4); and that an access opening (14) is provided in the shell element (5) are neither disclosed in D1 nor in the remaining documents of the available prior art.

Said documents even if combined together (supposed a skilled man would do it) would not lead to the solution proposed in claim 1.

For these reasons the solution is not considered to be obvious.

The solution described in Claim 1 offers the further advantage that when the exchangeable cover is removed the vibrator is protected by the shell element reducing the risk of being accidentally damaged.

Dependent claims:



International application No. PCT/EP03/05069

EXAMINATION REPORT - SEPARATE SHEET

The Claims 2-8 being dependent claims of claim 1 that meets the requirements of the PCT with respect to novelty and inventive step are also considered to be in conformity with the PCT.

Industrial application

The claimed invention is considered as susceptible of industrial application.

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An electronic device with a vibrator and an exchangeable cover

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Technical field

The invention relates to an electronic device comprising

- a frame part;
- a PCB (printed circuit board) provided with electronic components, which PCB is connected to the frame part;

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- a vibrator electrically connected to the PCB, which vibrator is fixed in relation to the frame part by means of an elastic fitting; and
- an exchangeable outer cover releaseably connected to the frame part.

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Related prior art

Many electronic devices, such as mobile telephones, pagers, PDAs, etc., are provided with a vibrator that silently alerts a user when a message or an incoming call is received. The vibrator usually comprises a small electromotor provided with an unbalanced mass at a rotating shaft, and it is usually mounted in the electronic device by means of an elastic fitting, such as a rubber grommet or a flexible metal holder.

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In electronic devices provided with fixed covers, such as a front cover and a back cover, the vibrator is conventionally mounted in a recess provided at the inner surface of one of the covers. However, in the electronic devices to which the invention relates, i.e. electronic devices provided with at least one exchangeable cover, the vibrator is positioned away from the exchangeable cover in order to ensure that the user does not accidentally destroy the vibrator or loosen it from its contact with the PCB. In these electronic devices the vibrator may be mounted in a recess of a not-exchangeable cover or in a holder that is connected to the PCB.

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However, when the vibrator is located away from the exchangeable cover the vibration that is produced when the unbalanced mass rotates must travel through a number of elements, such as the PCB and internal frame parts, before it reaches the exchangeable cover. The passage through these various elements dampens the vibration before it reaches the exchangeable cover, whereby the vibration that is experienced at the exchangeable cover is substantially weaker than the vibration at the location of the vibrator.

10 Object of the invention

Electronic devices such as mobile telephones and components are therefore to an increasing extent made smaller and smaller. However, if the vibration waves must travel through a number of elements before they reach the cover, a relatively large vibrator must be employed in order to ensure that the experienced vibration has a certain magnitude. A smaller vibrator can be employed if it is mounted directly in a recess provided in the exchangeable cover, which, however, is undesirable since it would entail that the vibrator must be dismounted from the cover and re-mounted in the new cover. If such operation is necessary there is a great risk that the vibrator is lost or remounted wrongly which may cause the vibrator or other electronic components to be destroyed when the new cover is mounted.

It is therefore an object of the invention to provide an electronic device as mentioned in the opening paragraph in which it is possible to use a small vibrator that cannot be accidentally destroyed or loosened from the PCB and that is in relatively close contact with the exchangeable cover.

30 Summary of the invention

The object of the invention is achieved by arranging the electronic device mentioned in the opening paragraph in such manner that the exchangeable outer cover abuts on the elastic fitting when the exchangeable outer cover is mounted on the electronic device.

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Thereby is achieved that the vibrator can be securely mounted in the main body of the electronic device while the vibration waves generated by the vibrator may still be transferred directly to the exchangeable cover via the elastic fitting provided on the vibrator. Another advantage that is achieved by arranging the exchangeable cover in abutment on the elastic fitting is elimination of the known problem of a rattling cover where the high requirements to production tolerances of the coupling means of the exchangeable cover and of the electronic device are not met. In the electronic device according to the invention the exchangeable cover abuts on the elastic fitting, and due to the inherent elasticity of the elastic fitting it is ensured that the exchangeable cover is always in elastic abutment on the elastic fitting thereby eliminating any tolerance slip. No rattling of the cover will therefore occur.

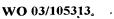
In a preferred embodiment of the invention the electronic device is provided with a protective shell element that is connected to the frame part, which protective shell element is positioned between the PCB and the exchangeable outer cover; and the vibrator is mounted on the protective shell element. The protective shell element thereby holds the vibrator as well as protects any other electronic components positioned on the PCB, and the risk of accidentally destroying or loosening of parts or components when the cover is removed is minimized.

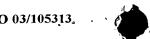
Preferably, the vibrator is mounted on a side of the shell element that faces towards the PCB, and an access opening is provided in the shell element through which the exchangeable outer cover abuts on the elastic fitting. Thereby the vibrator is also protected by the shell element and the risk of accidentally destroying or loosening the vibrator when the cover is removed is minimized.

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In a first embodiment of the invention the elastic fitting is provided with a protruding fitting part that protrudes through the access opening, and in a second embodiment of the invention the exchangeable outer cover is provided with a protruding cover part that protrudes through the access opening. The function of either of these embodiments is to ensure that the exchangeable cover abuts on the elastic fitting.





Claims

- 1. An electronic device (1) comprising
 - a frame part (3);
- a PCB (printed circuit board) (4) provided with electronic components, .5
 - said PCB (4) being connected to said frame part (3);
 - a vibrator (9) electrically connected to said PCB (4),
 - said vibrator (9) being fixed in relation to said frame part (3) by means of an elastic fitting (11;111;211); and
- an exchangeable outer cover (2;102;202) releaseably connected to 10 said frame part (3);

characterised in that said exchangeable outer cover (2;102;202) abuts on said elastic fitting (11;111;211) when said exchangeable outer cover (2;102;202) is mounted on said electronic device (1).

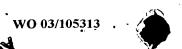
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- 2. An electronic device according to claim 1, characterised in that a protective shell element (5) is connected to the frame part (3), said protective shell element (5) being positioned between said PCB (4) and said exchangeable outer cover (2;102;202); and that the vibrator (9) is mounted on said protective shell element (5).
- 3. An electronic device according to claim 2, characterised in that the vibrator (9) is mounted on a side of the shell element (5) that faces the PCB (4); and that an access opening (14) is provided in the shell element (5) through which the exchangeable outer cover (2;102;202) abuts on the elastic fitting (11;111;211).
 - 4. An electronic device according to claim 3, characterised in that the elastic fitting (11;211) is provided with a protruding fitting part (16) that protrudes through the access opening (14).
 - 5. An electronic device according to claim 3, characterised in that the exchangeable outer cover (102) is provided with a protruding cover part (116) that protrudes through the access opening (14).





- 6. An electronic device according to any one of claims 1-5, **characterised in** that the vibrator (9) comprises a housing (12); and that the elastic fitting (11;111;211) surrounds at least a major part of the housing (12).
- 7. An electronic device according to any one of claims 1-6, **characterised in** that the elastic fitting comprises a rubber grommet (11;111).
 - 8. An electronic device according to any one of claims 1-6, **characterised in** that the elastic fitting comprises a flexible metal holder (211).
 - 9. An electronic device according to any one of claims 1-8, **characterised in** that the electronic device (1) is a mobile radio station, such as a mobile telephone.
- 10. An electronic device according to claim 9, **characterised in** that the exchangeable outer cover (2;102;202) is a front cover; and that the frame part (3) is a back cover.

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